

SPECIES

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Occurrence of ragged sea hare, *Bursatella leachii* Blainville, 1817

(Gastropoda: Heterobranchia: Aplysiidae) from Vellar Estuary, Tamil Nadu, India

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ABSTRACT

This paper documents a new record of *Bursatella leachii* Blainville, 1817 from Vellar estuary, Parangipettai, South-eastern coast of Tamil Nadu. Eight specimens of *Bursatella leachii* with standard length (SL) of 43.48–55.92 mm and weight of 20.9–26.2g were collected at Vellar estuary, Parangipettai, during June 2021 - July 2022. The present record of this species from estuarine waters of Tamil Nadu, India expands and confirms the known distribution of *Bursatella leachii*, previously reported from Australia, Brazil, Canada, China, Greece, Hong Kong, Iran, Israel, Italy, Japan, Lebanon, Malta, Marshall Island, Mozambique, Panama, Philippines, Slovenia, South Africa, Tunisia, Turkey and United Kingdom.

Keywords: Ragged Sea Hare, Vellar estuary, South east coast of India.

1. INTRODUCTION

Molluscs are the second largest animal phylum on earth and include an enormous diversity of species (Gosliner et al., 2008). Along the Indian coast, Phylum Molluca comprises of 6 orders and 53 families, 292 species of marine heterobranchia with 14 aplysiidae family (Sreeraj, 2020). Sea Hare are generally termed as ‘butterflies of the ocean’ because of their prominent coloration (Behera et al., 2020). *B. leachii* Blainville, (1817) a gastropod mollusc of the order Anaspidea and family Aplysiidae, colloquially known as ragged sea hare and shaggy sea hare. The genus *Bursatella* contains only three species, *Bursatella hirsuta* Nimbs and Wilson, (2020) (southern and western Australia); *Bursatella leachii* Blainville, (1817) (Pantropical distribution which includes South Africa to Indo-Pacific region); *Bursatella ocelligera* (Bergh, 1902) (Philippines).

B. leachii are usually observed in intertidal and subtidal of ocean inlets and sand or muddy bottoms of estuaries. This species frequently encountered from tropical and subtropical seagrass and mangrove communities (Lowe and Turner, 1976). Clarke, (2004) stated that this species mostly depends on seagrass habitats because of their sporadic high densities and their feeding specialization on cyanobacteria. *B. leachii* is distributed worldwide in warm temperate to tropical

marine environments (Clarke, 2006; Selfati et al., 2017) and there are reports on the occurrence of this species in estuarine environments (Sethi et al., 2015). The maximum standard length (SL) recorded for this species is 250 mm (Voss, 1980). The type specimen of this species was originally collected from Italy, Levantine coast, France, Morocco, southern Spain and east Mediterranean Red Sea.

During our survey on molluscan diversity of Parangipettai coast, India we collected the above species from the Vellar estuary and confirmed the occurrence of this species in this estuary for the first time. Thus, present record of this species from Vellar estuary expands and confirms the known distribution of *Bursatella leachii*, which is previously reported from Pulicat Lake (Sethi et al., 2015) and Krishna estuary (Behera et al., 2020) in India.

2. MATERIALS AND METHODS

Monthly fish surveys were conducted in Vellar estuary, south-east India, from June 2021 to July 2022, to document cryptic species diversity. Specimens of *Bursatella* were collected using scoop net and by hand picking methods during the receding period of the incoming tides.

Five specimens of *B. leachii* from Vellar mangrove zone ($11^{\circ}29'25''\text{N}$, $79^{\circ}45'57''\text{E}$) on during low tide, when the intertidal region was partially exposed. Three specimens from small seagrass bed adjacent to the fish pond ($11^{\circ}29'32''\text{N}$, $79^{\circ}46'06''\text{E}$). This sand-dwelling species were procured and preserved after undertaking morphological studies.

Morphometric and meristic characters were observed and measured from live specimens anesthetized using clove oil and then euthanized and fixed in 10% formaldehyde and later preserved in 70% ethanol (R). Specimens were identified to species level and measured, based on Bebbington, 1974. Preserved specimens were deposited in the Centre of Advanced Studies in Marine Biology, Faculty of Marine Sciences, Annamalai University, Reference Museum (CASMBURM), Parangipettai, India for further future studies.



Figure 1 Dorsal head region with (A) Two oral tentacles; (B) Two olfactory tentacles (rhinophores); (C) Ocelli (blue eyespots) and (D) Dorsal view of live *Bursatella leachii* Blainville, (1817) collected from Vellar estuary (CASMBURM/230521)

3. RESULTS

Systematics

ORDER Aplysiida Lamarck, 1809

FAMILY Aplysiidae Lamarck, 1809

GENUS *Bursatella* Blainville, 1817

Bursatella leachii Blainville, 1817

Material examined

Five specimens (46.61-55.92 mm SL and weight 21.4-26.2g) (CASMBURM/230520-24), coll. R.B. Chryso on 11 June 2022, intertidal mangrove zone opposite to the Marine Biological Research station, Vellar Estuary ($11^{\circ}29'25''\text{N}$, $79^{\circ}45'57''\text{E}$); Three specimens (43.48-

51.23 mm SL and weight 20.9-24.0g) (CASMBURM/230525-27), coll. S. Ragul, 02 July, 2022, a small seagrass bed (*Halodule* sp.), Vellar Estuary, (11°29'32"N, 79°46'06"E), Tamil Nadu.

Description

The body is compressed with prominent head and neck regions (Figure 1D); head part is wide and short. The body surface was covered with both simple and compound villus of various sizes, with multiple branched villi over the head, cephalic tentacles and the rhinophores region. Dorsal side of the body is blackish grey with olive-green and there were several blue rimmed black blotched ocelli (blue eyespots) scattered over the body (Figure 1C).

The body is also covered with many long, fleshy white branched villi that give the species its ragged appearance. Head comprises with four tentacles: Two olfactory tentacles called rhinophores (Figure 1B) originating on the dorsal part of the head and two oral tentacles (Figure 1A), above the mouth region. The gill is protected by a pair of fleshy parapodia. The parapodia were joined high up posteriorly leaving an oval slit on the summit. The foot was rather broad for its length and its anterior margin was double.

Coloration

Colour in live specimen, blackish grey with olive-green and there were several blue rimmed black blotched ocelli scattered over the body. Preserved specimen, faded brown body with black eye spots.

4. DISCUSSION

B. leachii is a complex species which has posed many taxonomic statuses with seven geographical subspecies as well as on morphological differences (Eales and Engel, 1935; Rudman, 2007; Bazzicalupo et al., 2020). Rudman, (2007) states that the colour of eye spots can vary within a local population, as can the background colour and the degree of 'woolliness' of *B. leachii*. Correspondingly the Seven subspecies i.e., *Bursatella leachii africana* (Engel, 1926: South Africa; very woolly in appearance), *Bursatella leachii guineensis* (Bebbington, 1969: Ghana; less woolly than *B. leachii Africana*; peacock blue eye spots rather than green), *Bursatella leachii lacinulata* (Gould, 1852: Brazil), *Bursatella leachii leachii* (Blainville, 1817: Indo-Pacific; green ocelli), *Bursatella leachii pleii* (Rang, 1828: West Indies), *Bursatella leachii rosea* (Engel, 1926: West Africa; pinkish in colour), *Bursatella leachii savigniana* (Audouin, 1826: Red Sea)

This species feeds on filamentous brown algae (Masterson, 2008). Correspondingly, From India Sethi et al., (2015) have reported *B. leachii* with maximum length of 75 mm and weight of 23 g from Pulicat Lake and Behera et al., (2020) recorded the average total length of 30.93 ± 1.34 mm and weight of 4.10 ± 0.74 g from Krishna estuary respectively. Ozvarol, (2014) have reported the maximum size of 150 mm along the Mediterranean coast, Turkey.

Appleton et al., (2002) isolated a novel bioactive compound malyngamide from *B. leachii* from New Zealand. Kamiya et al., (2006) derived few antimicrobial and cytotoxic proteins from sea hares. Rajaganapathi et al., (2002) have derived anti-HIV properties from purple fluid protein of Sea Hare, *B. leachii*. Capper et al., (2005) supposed that the sea hare consumes on filamentous cyanobacterium, *B. leachii* capable of sequestering secondary toxic metabolites (e.g., lyngbyatoxin-a) in the digestive gland and in bodily secretions. There is very limited knowledge of the diversity, distribution and occurrence of sea hares from the estuaries of Tamil Nadu. This present report confirms the occurrence of *Bursatella leachii* Blainville, 1817 from Vellar estuarine waters.

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Author's contribution

Chryso RB collected the specimens and drafted the manuscript. Ragul S prepared the images and reviewed the draft manuscript.

Informed consent

Not applicable.

Ethical approval

The ethical guidelines are followed in the study for species observation & identification.

Conflicts of interests

The authors declare that there are no conflicts of interests.

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Data and materials availability

All data associated with this study are present in the paper.

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